



**UNITED STATES DEPARTMENT OF COMMERCE**  
**Patent and Trademark Office**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/161,196 09/25/98 HINTERMAIER

F GR-97-P-2734

EXAMINER

MM91/1106

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NGUYEN, C

ART UNIT

PAPER NUMBER

2811

DATE MAILED:

11/06/00

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.

09/16/1996

Applicant(s)

HINTER MAIER

Examiner

CUONG Q NGUYEN

Group Art Unit

2811

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE three MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

## Status

- ☐ Responsive to communication(s) filed on \_\_\_\_\_.
- ☒ This action is **FINAL**.
- ☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 1 1; 453 O.G. 213.

## Disposition of Claims

- ☒ Claim(s) 1-24 is/are pending in the application.
- Of the above claim(s) 2, 4, 6, 13-24 is/are withdrawn from consideration.
- ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- ☒ Claim(s) 1, 3, 5, 7-12 is/are rejected.
- ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- ☐ Claim(s) \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

- ☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
  - ☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been received.
  - ☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.
  - ☐ received in this national stage application from the International Bureau (PCT Rule 1 7.2(a)).

\*Certified copies not received: \_\_\_\_\_

## Attachment(s)

- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_
- ☐ Interview Summary, PTO-413
- ☐ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Other \_\_\_\_\_

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## DETAILED ACTION

### *Claim Rejections - 35 U.S.C. § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1, and 7-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Summerfelt et al. (US 5,566,045).

Regarding claims 1, 7, 8, 9, Summerfelt et al. discloses a capacitor structure in an integrated semiconductor device comprising: a semiconductor substrate (30); a first electrode (34, a platinum group materials. See Summerfelt et al.'s col.10) connected to a doped region (44), capacitor dielectric layer (38, a BST layer with a dielectric constant greater than 100. See Summerfelt et al.'s col.11) formed on the first electrode; a barrier layer (52, a GaP layer. See Summerfelt et al.'s col.13) which is a compound of a transition element (Ga) and phosphorus formed below the capacitor dielectric layer; a second electrode formed on the capacitor dielectric layer. See Summerfelt et al.'s Fig.12.

Claims 1, 3-5, and 7-12 are rejected under 35 U.S.C. 102(a) as being anticipated by Kawakubo et al. (US 5,691,219).

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Regarding claims 1, 3, 7, 8, 9, 10, 11, Kawakubo et al. discloses a capacitor structure in an integrated semiconductor device comprising: a semiconductor substrate (1) having a doped region (6b) therein; a first electrode (13, a platinum alloy) connected to the doped region through a connection structure (11, a phosphorus-doped polysilicon layer. See Kawakubo et al.'s col.7 lines 39-43); a capacitor dielectric layer (14, a BST layer with a dielectric constant greater than 100. See Kawakubo et al.'s col.8 lines 5-8) formed on the first electrode; a barrier layer (12, a layer of transition metal such as Ti or Ta. See Kawakubo et al.'s col.7 lines 55-60 ) formed below the capacitor dielectric layer; a second electrode (14) formed on the capacitor dielectric layer. See Kawakubo et al.'s Fig.4E.

Kawakubo et al. does not explicitly teach that the barrier is a compound of a transition element and phosphorus. It is inherent that the transition metal layer (12) will react with phosphorus from the connection structure to form a barrier material such as a TiP or TiP. Therefore, it is inherent that Kawakubo et al.'s device including a barrier layer of TaP or TiP. See reference US6015997 col.7 lines 55-60 which was cited to support the inherence.

Regarding claims 4-5, as shown in Fig.4E, the barrier layer is disposed directly underneath the first electrode, covers entire an interface between the first electrode and the connection structure and covers entire an interface between the first electrode and the capacitor dielectric.

Regarding claim 12, Kawakubo et al. teaches that the capacitor connected to a selection transistor through the doped region (6b). See Fig.4E.

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***Response to Arguments***

2. Applicant's arguments with respect to claims 1, 3, 5, 7-12 have been considered but are not persuasive.

Applicants argue that gallium, titanium and tantalum are not transitional elements. This argument is not persuasive since US705685, US5990348, US6043184, US6060419, US5668040, US5478416, and US5384470 are clearly teach that gallium, titanium and tantalum are transitional elements.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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3. Papers related to this application may be submitted to Technology center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the TC 2800 Fax center located in Crystal Plaza 4, room 4-C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Group 2811 Fax Center number is (703) 308-7722 and 308-7724. The Group 2811 Fax Center is to be used only for papers related to Group 2811 applications.

4. Any inquiry concerning this communication or any earlier communication from the Examiner should be directed to CUONG Q NGUYEN whose telephone number is (703) 308-1293. The Examiner is in the Office generally between the hours of 6:30 AM to 5:00 PM (Eastern Standard Time) Monday through Thursday.

5. Any inquiry of a general nature or relating to the status of this application should be directed to the Technology Center Receptionists whose telephone number is 308-0956.

CN

November 1, 2000

Steven Loke  
Primary Examiner

